

A Structurally-Integrated Ice Detection and De-Icing System for Unmanned Air Vehicles, Phase I

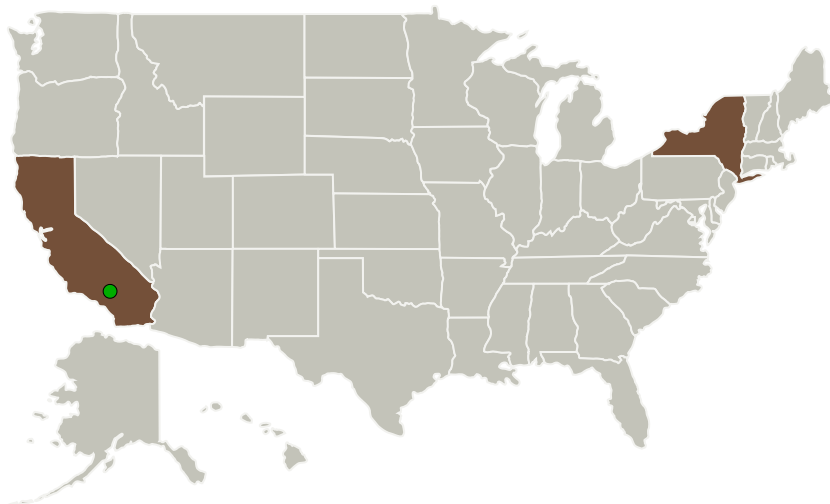
Completed Technology Project (2012 - 2012)



Project Introduction

Unmanned air vehicles (UAVs) are becoming more prevalent for Suborbital Scientific Earth Exploration, which often involves high altitude, long endurance flight missions. Extreme environmental conditions, especially involving sub-freezing temperatures (e.g. polar missions in support of the U.S. Global Change Research Program), can lead to the accretion of ice on control surfaces and jeopardize both the vehicle health and mission success. MesoScribe proposes the development of a structurally integrated ice detection and minimization system for implementation onto UAV platforms. The system, encompassing multifunctional detection and de-icing modules as well as power distribution arrays, will be designed and fabricated using Direct Write technology. Specifications will be identified based on the chosen system architecture for integrated switching networks, which will be required to toggle between detection and de-icing modes for power management. Prototype modules will be feasibility tested during Phase I to demonstrate concept efficacy and provide direction for development of the distributed system architecture. The proposed technology offers a variety of benefits for integration onto UAVs, including multifunctional icing detection/minimization capabilities, low-profile non-intrusive conductor networks, minimal power consumption, and ruggedized implementation.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
MesoScribe Technologies, Inc.	Lead Organization	Industry	Setauket, New York
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	New York

Project Transitions

▶ **February 2012:** Project Start

✓ **August 2012:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137927>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MesoScribe Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

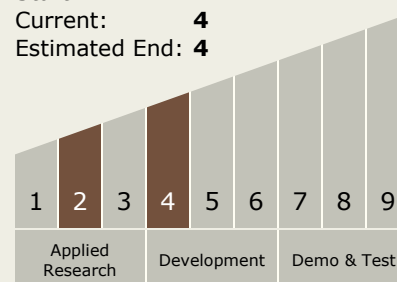
Carlos Torrez

Principal Investigator:

Jonathan Gutleber

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.3 Aero Propulsion
 - └ TX01.3.11 Engine Icing

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System